S.I.T.C. OF NETWORK AND ELECTRICAL ARRANGMENT FOR COMPUTER LAB AND LANGUAGE LAB AT IMU, KOLKATA CAMPUS.

"BOM" –Bill of Material

Sl.no	Description of items	Quantity	Unit
1.	SITC of 12U Wall mount Rack including fixing arrangements etc. as required at site (As per Technical Specification Annexure-1)	3	Nos.
2.	SITC of CAT 6, 24 port loaded patch panel in the Rack including connection set as reqd. (As per Technical Specification Annexure-1)	6	Nos.
3.	SITC of 24 Port Layer 2 Web Managed Gigabit Ethernet Switch with 4 Gigabit SFP Ports (As per Technical Specification Annexure-1)	06	Nos.
4.	SITC of 24 Port Layer 3 Web Managed Gigabit Ethernet Switch with 4Gigabit SFP Ports (As per Technical Specification Annexure-1)	01	Nos.
5.	SITC of Single mode 1000 Base-LX SFP Transceiver LC Type (As per Technical Specification Annexure-1)	16	Nos.
6.	SITC of Information Outlet CAT6,Single port with face plate along with Box on the table including suitable fixing arrangements etc. as reqd. (As per Technical Specification Annexure-1)	130	Nos.
7.	SITC of Cat 6 UTP 1-meter Patch cord (As per Technical Specification Annexure-1)	130	Nos.
8.	SITC of Cat 6 UTP 2-meter Patch cord (As per Technical Specification Annexure-1)	130	Nos.
9.	SITC of CAT 6 UTP Cable along With required PVC Conduit/casing capping and raceways for The networking of the computer points as per The proposed layout. The cost of PVC conduit of Medium class FRLS PVC Conduit for laying of CTA 6 cables for Computer points and required size Casing/ PVC Cable trunking is in the scope of Bidders only and shall be deemed to be included in the quoted rate against this serial . No separate payment will be made for conduit/casing/trunking and laying. Required Floor cutting and restoration needs to be included in this section and accordingly the rate is to be offered. (As per Technical Specification Annexure-1) **Note:** The measurement mentioned is approximate, the Final bill depends upon the actual consumption.	3050	Mtrs.
10.	SITC of 6 Core Single Mode Outdoor Armoured Fiber Optic Cable through required PVC Conduit for Network Connectivity (As per Technical Specification Annexure-1) **Note:** The measurement mentioned is approximate, the Final bill depends upon the actual consumption.	300	Mtrs.
11.	SITC of 12 Port Fully Loaded Drawer Type LIU (LC Duplex Loaded Type) Rack mountable including required Pigtails/Adapters (As per Technical Specification Annexure-1)	04	Nos.
12.	SITC of Fiber optic patch cord with two core (Duplex) fiber cable terminated with LC connector at one end and LC connector at other end type Single Mode Length 2 Mtrs.	16	Nos.

	(As per Technical Specification Annexure-1)		
13.	Supplying and fixing the following 01 No. 5/6 Amp modular switch and 01 No. 5/6 Amp modular socket and 01 No. 15/16 Amp modular switch and 01 No. 15/16 Amp modular socket on the modular plate and switch box, including connections and modular plate, Modular Box (6M), etc., as required.	133	Nos.
14.	Wiring for circuit/ sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class suitable Casing capping/raceways as required 2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire Note: The installation of electrical accessories, wiring, DBs, MCBs shall be strictly carried out as per the latest IS standards and CPWD Electrical Specifications. No looping is allowed; individual circuits are to be drawn from the DB to the Computer power box as per the CPWD internal EI manual 2023. The interested Prospective Bidders must visit the Site of installation to access the actual requirements of wiring, MCBs and DBs	As per the requirement for 130 Nos Computer points, 03 Rack supply etc.	Complete Job
15.	Wiring for circuit/ sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class suitable Casing capping/raceways as required 4 X 16 sq. mm + 1 X 6 sq. mm earth wire Note: The installation of electrical accessories, wiring, DBs, MCBs, and wall-mounted fans shall be strictly carried out as per the latest IS standards and CPWD Electrical Specifications. No looping is allowed; individual circuits are to be drawn as per the CPWD internal EI manual 2023. The interested Prospective Bidders must visit the Site of installation to access the actual requirements of wiring, MCBs and DBs	As per the requirement for 03 Nos UPS incoming and Outgoing and for Outgoing for the 10 Nos UPS DBs arrangement, for UPS input output connections	Complete Job
16.	Supplying and fixing 16 way, Double door, single pole and neutral, sheet steel, MCB distribution board, 240 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)	10	Nos
17.	Supplying and fixing 06 Amp Single pole MCB amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load in the existing MCB DB complete with connections, testing and commissioning etc. as required.	140	Nos
18.	Supplying and fixing 40 Amp Double pole MCB amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load in the existing MCB DB complete with connections, testing and commissioning etc. as required.	10	Nos
19.	Supplying and fixing of Single phase 100 Amp Copper bus bar including enclosed box along with other required accessories as reqd	03	Nos
20.	Supplying and fixing 63 Amp Double pole MCB including Supplying and fixing 2way, sheet steel MCB enclosure on	03	Nos

	surface phosphatized and powder painted i/c earthing etc. as reqd		
21.	Supplying and fixing of Four pole 63amps C series in the including Supplying and fixing 2way, sheet steel MCB enclosure on surface phosphatized and powder painted i/c earthing etc as reqd	03	Nos

SCOPE OF WORK:

SITCS (Supply, Installation, Testing, Commissioning & Support) of Networking and Electrical Arrangement for Computer and Language Lab at IMU- Kolkata.

The bidder has to comply with the following scope:

Scope:

- Supply of all Active and Passive components as per BOQ at IMU-Kolkata.
- Scope of Installation, Configuration and Integration
- Physical installation and powering of all Active and Passive components as per Network diagram provided by IMU-KC.
- Proper marking of cable, Safety Sign board/Route marker to be installed for cable laid underground and other miscellaneous work. Any structure, permanent or temporary, dismantled or destroyed during the execution of the work shall, will be refill/remake or restore to its previous condition by the network vendor at its own cost.
- Configuration and Integration of all of Active and Passive components as per the approved implementation plan.
- Configuration of VLAN and Inter VLAN routing as per implementation plan.
- Scope of Acceptance testing and commissioning
- After installation and configuration of each and every subsystem, integrating various systems and providing various services, tests shall be conducted for system performance as a whole.
- Commissioning shall mean end-to-end commissioning of the network with testing of live applications. Test parameters, commitments etc. shall be submitted along with implementation plan, which shall be approved by IMU, Kolkata.
- In the event, the test parameters, commitments are not submitted or not accepted explicitly in writing/minutes by IMU-KC, the Test parameters, commitments etc. as decided by IMU, Kolkata will be final and binding.
- Penetration test of the network after installation of IT/Network Devices.
- Upon Self testing and Commissioning, the system shall be offered for inspection by IMU-KC.
- The successful Bidder, along with IMU-KC shall prepare an inspection and acceptance schedule with details of each activity.
- Project network should be compatible with existing network.
- Any other extra accessories needed to fulfil the project should be supplied by the vendor.

Scope of Documentation

- Providing original manuals of all hardware items supplied.
- Implementation plan, to be approved by IMU-KC before initializing the installation and configuration activity.
- Test parameters, commitments etc. for acceptance testing to be enclosed along with implementation plan. The bidder will have to submit scan report for all network ports or wherever applicable. OTDR testing for fiber and Wire map and continuity Test report should be submitted.
- Documentation on Equipment/ rack layout plan and connectivity Diagram should be submitted in hard and soft copy. Credentials related to network equipment's should submitted in hard and soft copy.
- Technical write up of the network design and functioning, System and Network architecture

diagram, Active and Passive components configuration details, Security implementation and credential details.

- As built network configuration details (port wise) with IP address, subnet, VLAN, port description, etc. for all active components.
- Security implementation including VPNs, Firewall rules, IDS/IPS, ACL details etc.
- Operator manual for shutdown/start of the active resources.
- Acceptance test reports, performance test reports of networking components.
- Any other Relevant Documentation
- All safety and security norms to be followed during the execution of work.

Warranty & Support

- Bidder has to provide a three years' warranty for entire project.

Warranty Support & Escalation Mechanism: The successful bidder shall provide the details of a Single Point of Contact (SPOC) along with a clear escalation matrix for addressing any complaints during the warranty period.

Enough spares should be maintained against the faulty device, back up devices to be installed before sending the faulty devices sent to the repairs.

During the warranty period, the bidder shall adhere to the following response and resolution timelines:

Response Time: All complaints must be attended within 24 hours of reporting.

Resolution Time:

- Minor complaints shall be resolved within 24 hours.
- Major complaints shall be resolved within 48 hours.

Failure to comply with the above timelines shall attract penalties, as decided by the Competent Authority.

TECHNICAL SPECIFICATION

Annexure-1:

Item No 1: 12U Wall mount Rack Specification

12u Wall Mount Rack	12U Rack CCTV/NVR/Cabinet box wall mount with lock, with Fan, PDU, Cat6 UTP Cable Manager. Ingress Protection:- Industrial Standard- Dust and Moisture proof Dimension:- Min. 600mm x 600mm Thickness:- Side:2 mm Thick CRCA Sheet (Removable) Front Door:1.5 mm Thick CRCA Sheet Rear Door:1.5 mm Thick CRCA Sheet Top:2 mm Thick CRCA Sheet Front Door:- Glass Painting:- Powder coated, Min Thick 65-75 micron Lifting Hook: - 2 number. Earthing Bolt: - 1 No. Each Side or at least 1 No. Utility Socket:- One number to be provided Fan:- 2 Fan With Fan Housing Unit Cable management accessories:- To be provided for proper dressing of cables , 1 U Cable Manager Installation:- Mounting angles and mounting frames for interior installation for 19"

Item No 2: CAT 6, 24 Port loaded Patch Panel Technical Specification

CAT 6, 24 Port loaded Patch Panel	Category 6 UTP Patch Panel is an elegant design patch panel. The panel has two-piece structure design combined with both 24-port panel and cable management. The panel has 180- degree punch down design for convenient network Terminations. The panel cable marking and management shelf ensures proper routing of cables with proper bend radius compliance to avoid strain relief. Exceeds ANSI/TIA-568-C.2 Standard and supports 1000-Base-T. • 1U standard 19 inch rack mounted • Easy port labeling identification • Compatible with T568A or T568B wiring schemes • Accommodates 23~24 AWG Stranded and Solid Copper Wires Panel Size: 483mm x 132mm x 44.3mm (L x W x H)

	Standard Verification: - • ANSI/TIA-568-C.2 • ISO/IEC 11801:2002/AMMD.2:2010 • ISO/IEC 60603-7 Compliance • RoHS Compliance

Item No 3: 24 Port Layer 2 Web Managed Gigabit Ethernet Switch with 4 Gigabit SFP

Items	Parameter
Physical Ports	24 x 10/100/1000 Mbps Rj45 Ethernet Ports with 4 x Gigabyte SFP Ports
Switching Capacity	56 Gbps or better
Forwarding Capacity	41.7Mpps or better
Flash	32Mbit or better
DRAM	128Mbit or better
VLAN ID support	4k or better
ACL Table	1K or better
Port Queues	8 or better
L2 Features	Switch should support Auto-Negotiation for port speed and duplex mode
	Switch should support STP / RSTP / MSTP
	Switch should support Loopback Detection, BPDU Filter and BPDU Guard
	Switch should support IGMP v1/v2/v3 Snooping, IGMP Querier, IGMP Proxy, MVR
	Switch should support 256 IEEE 802.1q tag based VLAN with 4K vlan ID
	Switch should support Port Isolation (Multi-to-one)
	Switch should support Port Based VLAN, MAC Based VLAN, Voice VLAN, Guest VLAN
	Switch should support LACP 8 Groups, 8 Ports/ Group, Static Trunk

Item No 4: 24 Port Layer 3 Web Managed Gigabit Ethernet Switch with 4 Gigabit SFP

Items	Parameter
Physical Ports	24 x 10/100/1000 Mbps Rj45 Ethernet Ports with 4 x Gigabyte SFP Ports
Switching Capacity	56 Gbps or better
Forwarding Capacity	41.7Mpps or better
Flash	32Mbit or better
DRAM	128Mbit or better
VLAN ID support	4k or better
ACL Table	1K or better
Port Queues	8 or better

L3 Features	16 IPv4/IPv6 Interfaces
	Static Routing
	Static ARP
	316 ARP Entries
	Proxy ARP
	DHCP Server
	DHCP Relay
	DHCP L2 Relay

Item No 5: Single mode 1000Base-LX SFP Transceiver LC Type technical specification

Items	Parameter
Architecture	1000 Base LX Single-mode Fiber Transceiver
Connector	It should have duplex LC Connector
Flow control.	Support 802.3x
Mode	9/125 um Single mode Fiber Type up to 20 KM.
Support wave length	1310nm
Connector	It should have duplex LC Connector

Item No 6: Information Outlet CAT6, Single port with face plate along with Back Box Technical Specification

Items	Parameter
Information Outlet Cat 6	Physical Specification:
	Housing : High impact flame retardant plastic, Polycarbonate UL 94V-0 rated
	PCB : FR4, 1.6mm Thickness
	Jack Wire Terminals: Phosphor bronze base, gold over nickel plating
	Gold Plating : 30µ, Nickel Plating Base(Ni) : 40µ~80µ
	ISO/IEC 11801 2.2 Edition
Single Type Face Plate	Single, Face Plate Square (86 x 86mm) x 12 mm
	Mounting Frame with screw caps
	Shutter on Face Plate for closing ports to prevent from dust entry
	Port labeling with paper label and transparent plastic window to hold paper label
	Port labeling with paper label and transparent plastic window to hold paper label
	Supports UTP and STP Jacks Cat5e, Cat6 and Cat6A
	Suitable for 86 x 86 mm Square type Back box
PVC Back	Should have Robust and installer friendly design Surface Mount Boxes for Face

Box	Plates for a variety of media including voice and data, Audio, video and CAT V distribution to the work area.
	Should secure and protect wire with durable wall box
	Material : ABS
	Shape : Square Size : 86 x 86

Item No 7&8: Cat 6 UTP Patch Cord (1Meter and 2 Meter) Technical Specification

Items	Parameter
Cat 6 UTP Patch Cord (1 Meter / 2 Meter)	Category 6 patch cords with four pair twisted stranded copper wire cable terminated with RJ45 modular plugs at both the ends.
	Patch Cords 100% factory tested for better quality and suitable for the high speed data transmission.
	Complies with the ANSI/TIA/EIA-568-C.2, ISO/IEC 11801, and RoHS compliant Standard. Supports Data Networks Speeds Up to 10/100-Base-T and 1000-Base-T.
	T568B wiring scheme crimped at both connector ends.
	Patch cord conductor: 24 AWG, Stranded copper wires, Insulation : HDPE
	Connector Plug: 30µ" Gold plated contact, Phosphor Bronze base material
	Plug & Jack Contact Force : 100 Grams min. using FCC approved plug

Item No 9: CAT 6 UTP Cable Technical Specification

Items	Parameter
1	The 4 pair Unshielded Twisted Pair cable shall be UL Listed and ETL verified
2	This cable well exceeds the requirements of ANSI/TIA-568- C.2 and ISO/IEC 11801 Class E
3	Nominal Outer Diameter of Cable should be 5.8 ± 0.2 mm and Conductor Diameter 23 AWG
4	Construction: 4 twisted pairs separated by internal PE Cross Separator. Full separator. Half shall not be accepted. Rip Cord is must.
5	Conductor: Solid bare Copper, Outer jacket sheath: FRPVC with UL approved CM/CMR rated cable. Jacket color: Grey
6	Insulation Material: High Density Polyethylene (HDPE) with Insulation Diameter : 0.89 ± 0.01 mm
11	Cable should support operating temperature from -20° to +70°C or better

21	RoHS Compliant
22	Printed sequential Length Counter of each meter on Outer Jacket
23	Category 6 UTP cables shall Supports Gigabit Ethernet (1000 base-T) verified up to 600 Mhz.

Item No 10: 6 Core Single Mode Outdoor Armored Fiber Optic Cable technical Specification

Items	Parameter
1	06-Core, Single mode 9/125 micron primary coated buffers, 10G Ethernet OS2, Armoured Loose Tube, ECCS (Electrolytic Chrome Coated Steel) Tape, Jelly Filled Loose Tube.
2	Two Steel Wires/Rods embedded in outer periphery of the jacket as strength members. UV Stabilized jacket and protected from Rodent attacks
3	Complying to ANSI/TIA-568-C.3, ISO/IEC 11801, Telecordia GR-20 Core, ITU-T REC G.652D, IEC 60793-1/60794-1, EN 50173, RoHS Compliant
4	Suitable for use in indoor/outdoor ducts, direct burial and backbone cabling

PVC Conduit/Casing/Capping (For Fiber and CAT -6 Cable laying) Technical Specification

Items	Parameter
	PVC Conduit/Casing Must be ISI Make for UTP/Fibre and electrical Cable Laying Purpose (Size must be suitable as per site Requirement) (Make : Precision/AKG/Presto or similar)

Raceway Technical Specification

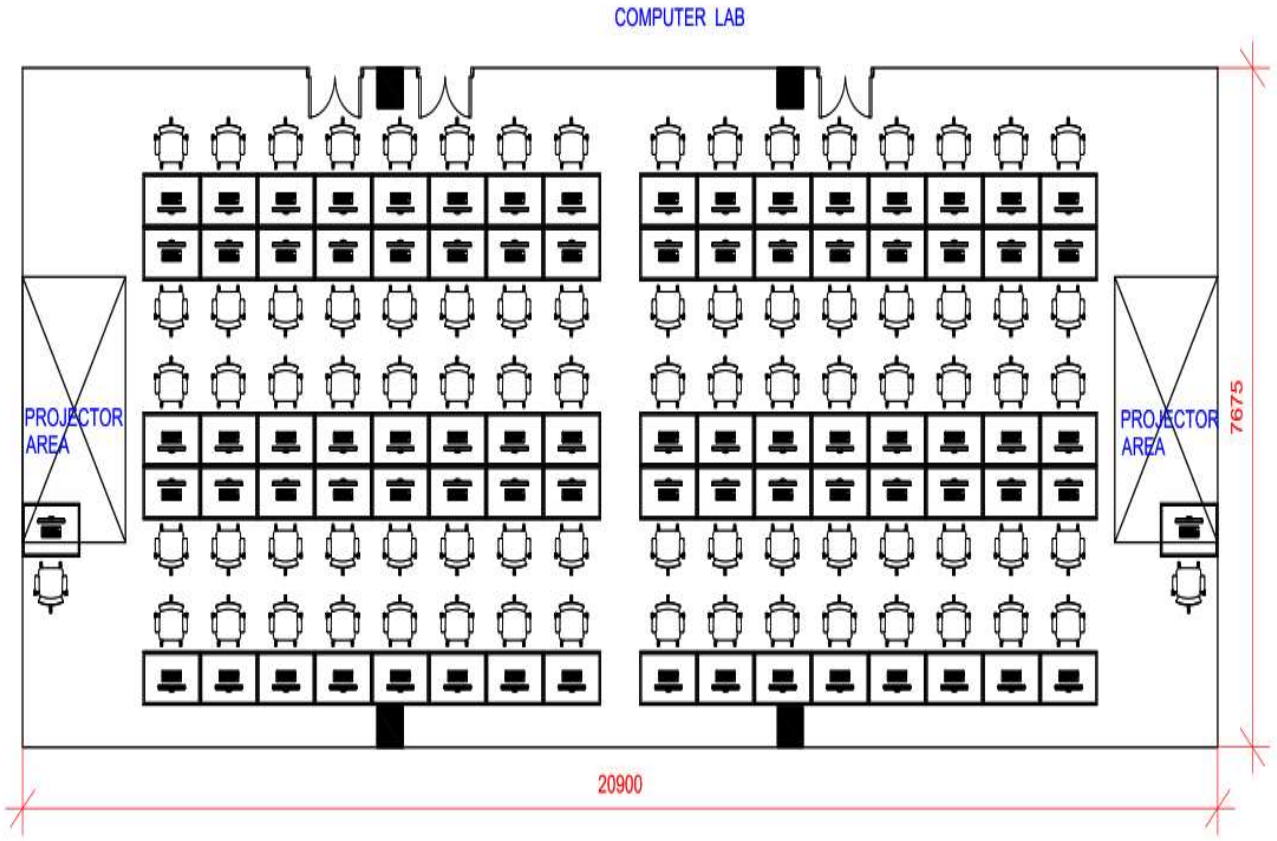
Items	Parameter
	Aluminum Raceway as per CPWD Standard (Size must suitable as per site Requirement) Raceways will be used as per actual requirement without any extra payment. There is requirement for cutting of tiles for installation of Raceways, the tiles need to be reinstalled in original shape without any extra payment

Item No 11: 12 Port Fully Loaded Drawer Type LIU Technical Specification

Items	Parameter
1	The Fiber Rack mount LIU loaded having Adapter panel fixed on drawer base frame, with Adapters and with Pigtails and assembled with splice tray as per the Loaded fiber port Requirement and their applicable accessories.
2	Suitable to mount at different positions (depth wise) on standard 1U 19 inch racks. Drawer type to pull out for easy Maintenance when assembled in racks.
3	Cold Rolled Steel material with black powder coating
4	Three types of cable entry holes for different size cables through cable glands, covered with rubber cable grommets/covers.
5	Splicing of 24 fibers in each plastic fiber splicing trays with integrated cable spool design.
6	Non removable top cover and no rear cover. Drawer type to pull out for better access of interior.
7	As per the BOM requirement, 06/12/24 LIU Loaded with 03/06/12 (LC Duplex) adapters and 06/12/24 (LC Simplex) Pigtails on rack mount ports.
8	As per the Loaded fiber port requirement Accessories kit consists of Cable management rings/Cable saddles, Cable glands (PG13.5, 2 nos.), Splice rods, Blanking clips, Velcro ties, Cable ties, Cable inlet/outlet hole covers(2 types, 2 nos.each)
9	Cable management rings/Cable saddles can be mounted inside the rack mount, no provision to mount outside in front of the adapter panel.
10	Standards: Comply as per ANSI/TIA-568-C.3, ISO/IEC 11801, RoHS Compliant.

Item No 12: Fiber optic patch cord with two core (Duplex) technical specification

Items	Parameter
	Fiber optic patch cord with two core fiber cable terminated with LC connector at one end and LC connector at other end
	100% factory terminated and tested for optical characteristics & fiber end face finish.
	Cable Diameter : 2.0 x 3.8 ± 0.2 (Duplex) or better
	Jacket color : Yellow, Jacket Material : LSZH, Length : 3 Mtr
	Zero Dispersion Wavelength : 1300 - 1324 nm
	Standards: IEC 60332-1, ANSI/TIA-568-C.3, ISO/IEC 11801 RoHS Compliant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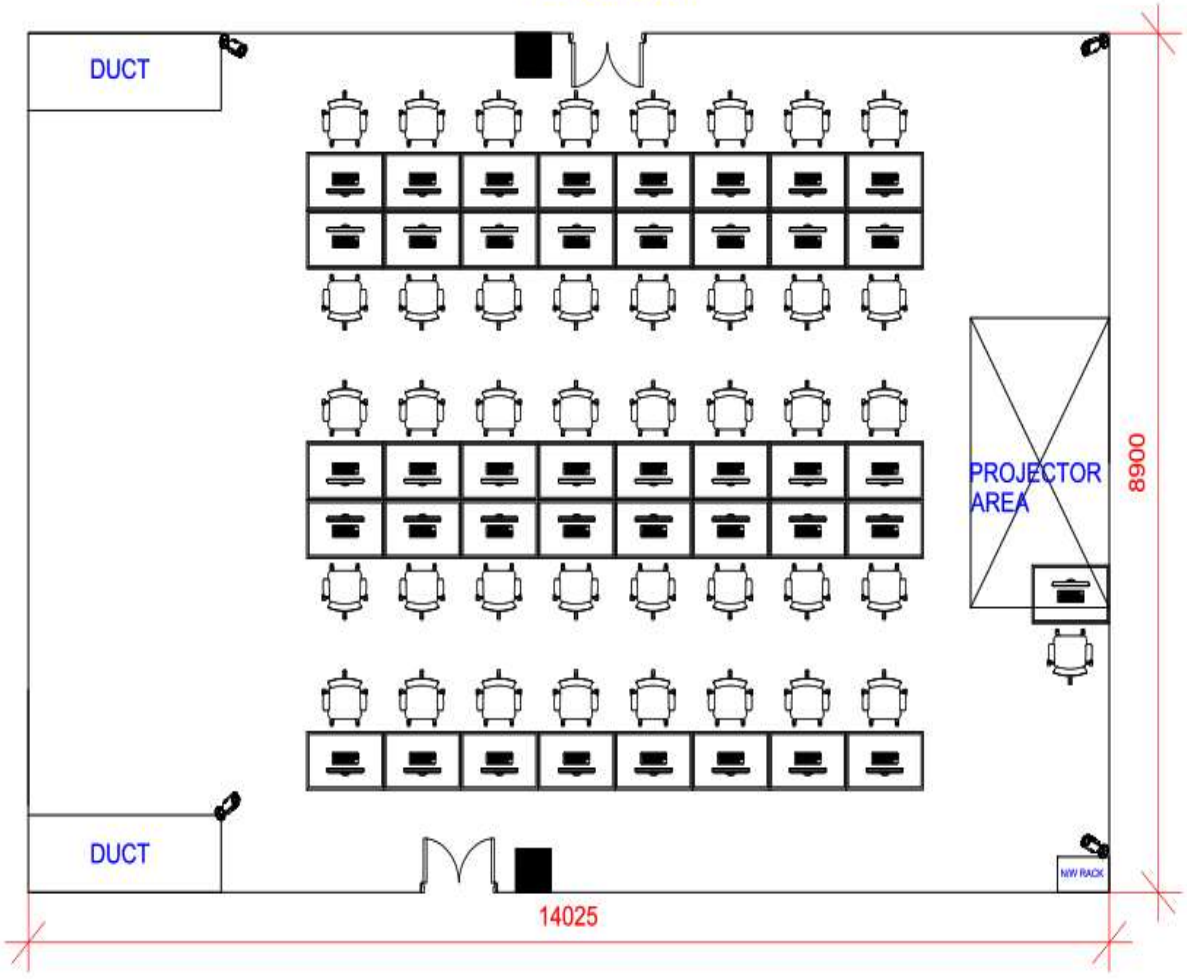

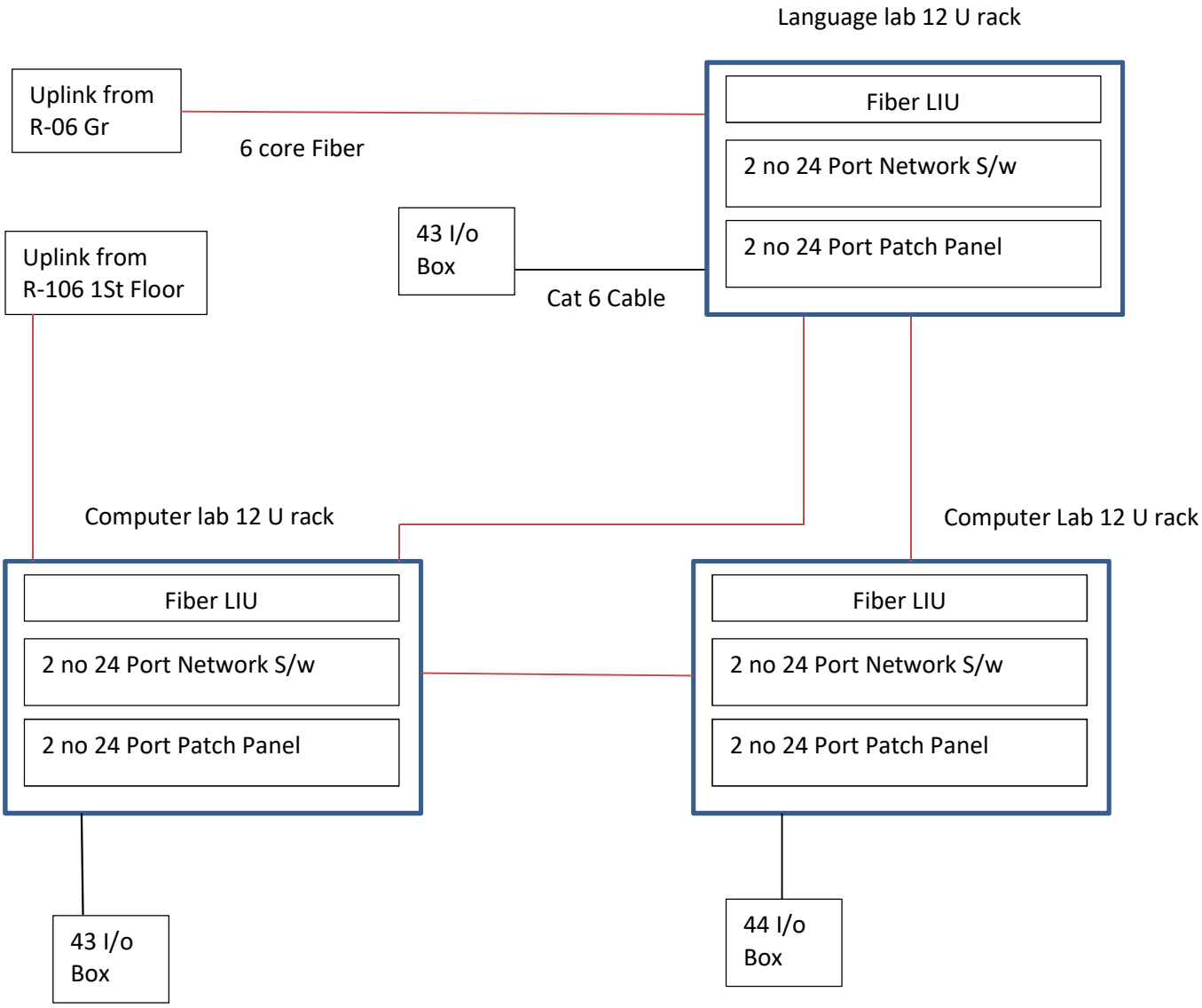
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Uplink from R-06 Gr
6 core Fiber
Fiber LIU
2 no 24 Port Network S/w
2 no 24 Port Patch Panel
43 I/o Box
Cat 6 Cable
Uplink from R-106 1St Floor
Computer lab 12 U rack
Computer Lab 12 U rack
Fiber LIU
2 no 24 Port Network S/w
2 no 24 Port Patch Panel
Fiber LIU
2 no 24 Port Network S/w
2 no 24 Port Patch Panel
43 I/o Box
44 I/o Box